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Appendix F.10

Area E

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$Intake = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

WHERE:	Cs = :		Concentration in soil (mg/kg)
	IR = :	100	Soil Ingestion Rate (mg/day)
	CF = :	1.0E-06	Conversion Factor (kg/mg)
	FI = :	1	Fraction from contaminated source (unitless)
	EF = :	20	Exposure Frequency (days/year)
	ED = :	24	Exposure Duration (years)
	BW = :	70	Body Weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	8,760	Averaging time for noncarcinogenic exposures (days)

Unit Dose		
Lifetime Chronic Daily Int	2.7E-08	kg-soil/kg-wt/day
Chronic Daily Intake = :	7.8E-08	kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	9.3	2.5E-07	7.3E-07	7.30E-01	NA	1.8E-07	2.0%	NA	NA
Benzo(a)pyrene	9.8	2.6E-07	7.7E-07	7.30E+00	NA	1.9E-06	21.0%	NA	NA
Benzo(b)fluoranthene	11	3.0E-07	8.6E-07	7.30E-01	NA	2.2E-07	2.4%	NA	NA
Dibenzo(a,h)anthracene	8.8	2.4E-07	6.9E-07	7.30E+00	NA	1.7E-06	18.9%	NA	NA
Indeno(1,2,3-cd)pyrene	9.4	2.5E-07	7.4E-07	7.30E-01	NA	1.8E-07	2.0%	NA	NA
Aldrin	0.061	1.6E-09	4.8E-09	1.70E+01	3.00E-05	2.8E-08	0.3%	1.6E-04	0.1%
Dieldrin	0.23	6.2E-09	1.8E-08	1.60E+01	5.00E-05	9.9E-08	1.1%	3.6E-04	0.1%
Aroclor, total	70	1.9E-06	5.5E-06	2.00E+00	2.00E-05	3.8E-06	41.1%	2.7E-01	94.3%
Antimony	3.1	8.3E-08	2.4E-07	NA	4.00E-04	NA	NA	6.1E-04	0.2%
Arsenic	22.1	5.9E-07	1.7E-06	1.50E+00	3.00E-04	8.9E-07	9.7%	5.8E-03	2.0%
Chromium (total)	170	4.6E-06	1.3E-05	NA	3.00E-03	NA	NA	4.4E-03	1.5%
Thallium	3.5	9.4E-08	2.7E-07	NA	6.60E-05	NA	NA	4.2E-03	1.4%
Vanadium	105	2.8E-06	8.2E-06	NA	7.00E-03	NA	NA	1.2E-03	0.4%
TEQ-Dioxin/Furan	0.000036	9.7E-13	2.8E-12	1.50E+05	NA	1.4E-07	1.6%	NA	NA
					Total	**9.1E-06**	**100%**	**2.9E-01**	**100%**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:	Cs = :		Concentration in soil (mg/kg)
	CF = :	1.0E-06	Conversion factor (kg/mg)
	SA = :	5,700	Skin surface available for contact (cm^2/event)
	AF = :	0.3	Soil to skin adherence factor (mg/cm^2)
	ABS = :		Absorption factor (unitless)
	EF = :	20	Exposure frequency (events/year)
	ED = :	24	Exposure duration (years)
	BW = :	70	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	8,760	Averaging time for noncarcinogenic exposures (days)

Unit Dose		
Lifetime Chronic Daily Intake	4.6E-07	kg-soil/kg-wt/day
Chronic Daily Intake = :	1.3E-06	kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	9.3	0.13	5.55E-07	1.62E-06	7.30E-01	NA	4.1E-07	2.1%	NA	NA
Benzo(a)pyrene	9.8	0.13	5.85E-07	1.71E-06	7.30E+00	NA	4.3E-06	22.6%	NA	NA
Benzo(b)fluoranthene	11	0.13	6.56E-07	1.91E-06	7.30E-01	NA	4.8E-07	2.5%	NA	NA
Dibenzo(a,h)anthracene	8.8	0.13	5.25E-07	1.53E-06	7.30E+00	NA	3.8E-06	20.3%	NA	NA
Indeno(1,2,3-cd)pyrene	9.4	0.13	5.61E-07	1.64E-06	7.30E-01	NA	4.1E-07	2.2%	NA	NA
Aldrin	0.061	NA	NA	NA	1.70E+01	3.00E-05	NA	NA	NA	NA
Dieldrin	0.23	NA	NA	NA	1.60E+01	5.00E-05	NA	NA	NA	NA
Aroclor, total	70	0.14	4.50E-06	1.31E-05	2.00E+00	2.00E-05	9.0E-06	47.5%	6.6E-01	99.6%
Antimony	3.1	NA	NA	NA	NA	6.00E-05	NA	NA	NA	NA
Arsenic	22.1	0.03	3.04E-07	8.87E-07	1.50E+00	3.00E-04	4.6E-07	2.4%	3.0E-03	0.4%
Chromium (total)	170	NA	NA	NA	NA	7.50E-05	NA	NA	NA	NA
Thallium	3.5	NA	NA	NA	NA	6.60E-05	NA	NA	NA	NA
Vanadium	105	NA	NA	NA	NA	1.80E-04	NA	NA	NA	NA
TEQ-Dioxin/Furan	0.000036	0.03	4.96E-13	1.45E-12	1.50E+05	NA	7.4E-08	0.4%	NA	NA
						Total	**1.9E-05**	**100%**	**6.6E-01**	**100%**

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
Benzo(a)anthracene	1.8E-07	4.1E-07	NA	5.9E-07	2.1%	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.9E-06	4.3E-06	NA	6.2E-06	22.0%	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	2.2E-07	4.8E-07	NA	6.9E-07	2.5%	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	1.7E-06	3.8E-06	NA	5.6E-06	19.8%	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.8E-07	4.1E-07	NA	5.9E-07	2.1%	NA	NA	NA	NA	NA
Aldrin	2.8E-08	NA	NA	2.8E-08	0.1%	1.6E-04	NA	NA	1.6E-04	0.0%
Dieldrin	9.9E-08	NA	NA	9.9E-08	0.4%	3.6E-04	NA	NA	3.6E-04	0.0%
Aroclor, total	3.8E-06	9.0E-06	NA	1.3E-05	45.4%	2.7E-01	6.6E-01	NA	9.3E-01	97.9%
Antimony	NA	NA	NA	NA	NA	6.1E-04	NA	NA	6.1E-04	0.1%
Arsenic	8.9E-07	4.6E-07	NA	1.3E-06	4.8%	5.8E-03	3.0E-03	NA	8.7E-03	0.9%
Chromium (total)	NA	NA	NA	NA	NA	4.4E-03	NA	NA	4.4E-03	0.5%
Thallium	NA	NA	NA	NA	NA	4.2E-03	NA	NA	4.2E-03	0.4%
Vanadium	NA	NA	NA	NA	NA	1.2E-03	NA	NA	1.2E-03	0.1%
TEQ-Dioxin/Furan	1.4E-07	7.4E-08	NA	2.2E-07	0.8%	NA	NA	NA	NA	NA
Total	**9.1E-06**	**1.9E-05**	**NA**	**2.8E-05**	**100.0%**	**2.9E-01**	**6.6E-01**	**NA**	**9.5E-01**	**100.0%**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

WHERE:	Cs = :		Concentration in soil (mg/kg)
	IR = :	50	Soil Ingestion Rate (mg/day)
	CF = :	1.0E-06	Conversion Factor (kg/mg)
	FI = :	1	Fraction from contaminated source (unitless)
	EF = :	20	Exposure Frequency (days/year)
	ED = :	7	Exposure Duration (years)
	BW = :	70	Body Weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	2,555	Averaging time for noncarcinogenic exposures (days)

Unit Dose		
Lifetime Chronic Daily Int	3.9E-09	kg-soil/kg-wt/day
Chronic Daily Intake = :	3.9E-08	kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.3	5.1E-09	5.1E-08	7.30E-01	NA	3.7E-09	1.7%	NA	NA
Benzo(a)pyrene	1.4	5.5E-09	5.5E-08	7.30E+00	NA	4.0E-08	17.8%	NA	NA
Benzo(b)fluoranthene	1.8	7.0E-09	7.0E-08	7.30E-01	NA	5.1E-09	2.3%	NA	NA
Dibenzo(a,h)anthracene	1.2	4.7E-09	4.7E-08	7.30E+00	NA	3.4E-08	15.3%	NA	NA
Indeno(1,2,3-cd)pyrene	1.3	5.1E-09	5.1E-08	7.30E-01	NA	3.7E-09	1.7%	NA	NA
Aldrin	0.01	3.9E-11	3.9E-10	1.70E+01	3.00E-05	6.7E-10	0.3%	1.3E-05	0.0%
Dieldrin	0.028	1.1E-10	1.1E-09	1.60E+01	5.00E-05	1.8E-09	0.8%	2.2E-05	0.1%
Aroclor, total	15	5.9E-08	5.9E-07	1.00E+00	2.00E-05	5.9E-08	26.2%	2.9E-02	87.6%
Antimony	2.1	8.2E-09	8.2E-08	NA	4.00E-04	NA	NA	2.1E-04	0.6%
Arsenic	11.8	4.6E-08	4.6E-07	1.50E+00	3.00E-04	6.9E-08	30.9%	1.5E-03	4.6%
Chromium (total)	70.5	2.8E-07	2.8E-06	NA	3.00E-03	NA	NA	9.2E-04	2.7%
Thallium	1.8	7.0E-09	7.0E-08	NA	6.60E-05	NA	NA	1.1E-03	3.2%
Vanadium	68	2.7E-07	2.7E-06	NA	7.00E-03	NA	NA	3.8E-04	1.1%
TEQ-Dioxin/Furan	0.000012	4.7E-14	4.7E-13	1.50E+05	NA	7.0E-09	3.1%	NA	NA
					Total	**2.2E-07**	**100%**	**3.4E-02**	**100%**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{AbsorbedDose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:	Cs = :		Concentration in soil (mg/kg)
	CF = :	1.0E-06	Conversion factor (kg/mg)
	SA = :	5,700	Skin surface available for contact (cm^2/event)
	AF = :	0.04	Soil to skin adherence factor (mg/cm^2)
	ABS = :		Absorption factor (unitless)
	EF = :	20	Exposure frequency (events/year)
	ED = :	7	Exposure duration (years)
	BW = :	70	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	2,555	Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake 1.8E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.3	0.13	3.02E-09	3.02E-08	7.30E-01	NA	2.2E-09	2.2%	NA	NA
Benzo(a)pyrene	1.4	0.13	3.25E-09	3.25E-08	7.30E+00	NA	2.4E-08	23.9%	NA	NA
Benzo(b)fluoranthene	1.8	0.13	4.18E-09	4.18E-08	7.30E-01	NA	3.0E-09	3.1%	NA	NA
Dibenzo(a,h)anthracene	1.2	0.13	2.78E-09	2.78E-08	7.30E+00	NA	2.0E-08	20.4%	NA	NA
Indeno(1,2,3-cd)pyrene	1.3	0.13	3.02E-09	3.02E-08	7.30E-01	NA	2.2E-09	2.2%	NA	NA
Aldrin	0.01	NA	NA	NA	1.70E+01	3.00E-05	NA	NA	NA	NA
Dieldrin	0.028	NA	NA	NA	1.60E+01	5.00E-05	NA	NA	NA	NA
Aroclor, total	15	0.14	3.75E-08	3.75E-07	1.00E+00	2.00E-05	3.7E-08	37.7%	1.9E-02	98.9%
Antimony	2.1	NA	NA	NA	NA	6.00E-05	NA	NA	NA	NA
Arsenic	11.8	0.03	6.32E-09	6.32E-08	1.50E+00	3.00E-04	9.5E-09	9.5%	2.1E-04	1.1%
Chromium (total)	70.5	NA	NA	NA	NA	7.50E-05	NA	NA	NA	NA
Thallium	1.8	NA	NA	NA	NA	6.60E-05	NA	NA	NA	NA
Vanadium	68	NA	NA	NA	NA	1.80E-04	NA	NA	NA	NA
TEQ-Dioxin/Furan	0.000012	0.03	6.43E-15	6.43E-14	1.50E+05	NA	9.6E-10	1.0%	NA	NA
						Total	**9.9E-08**	**100%**	1.9E-02	**100%**

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
Benzo(a)anthracene	3.7E-09	2.2E-09	NA	5.9E-09	1.8%	NA	NA	NA	NA	NA
Benzo(a)pyrene	4.0E-08	2.4E-08	NA	6.4E-08	19.7%	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	5.1E-09	3.0E-09	NA	8.2E-09	2.5%	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	3.4E-08	2.0E-08	NA	5.5E-08	16.9%	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	3.7E-09	2.2E-09	NA	5.9E-09	1.8%	NA	NA	NA	NA	NA
Aldrin	6.7E-10	NA	NA	6.7E-10	0.2%	1.3E-05	NA	NA	1.3E-05	0.0%
Dieldrin	1.8E-09	NA	NA	1.8E-09	0.5%	2.2E-05	NA	NA	2.2E-05	0.0%
Aroclor, total	5.9E-08	3.7E-08	NA	9.6E-08	29.7%	2.9E-02	1.9E-02	NA	4.8E-02	91.7%
Antimony	NA	NA	NA	NA	NA	2.1E-04	NA	NA	2.1E-04	0.4%
Arsenic	6.9E-08	9.5E-09	NA	7.9E-08	24.3%	1.5E-03	2.1E-04	NA	1.8E-03	3.3%
Chromium (total)	NA	NA	NA	NA	NA	9.2E-04	NA	NA	9.2E-04	1.8%
Thallium	NA	NA	NA	NA	NA	1.1E-03	NA	NA	1.1E-03	2.0%
Vanadium	NA	NA	NA	NA	NA	3.8E-04	NA	NA	3.8E-04	0.7%
TEQ-Dioxin/Furan	7.0E-09	9.6E-10	NA	8.0E-09	2.5%	NA	NA	NA	NA	NA
Total	**2.2E-07**	**9.9E-08**	**NA**	**3.2E-07**	**100.0%**	**3.4E-02**	**1.9E-02**	**NA**	**5.2E-02**	**100.0%**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CHILD - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

WHERE:	Cs = :		Concentration in soil (mg/kg)
	IR = :	100	Soil Ingestion Rate (mg/day)
	CF = :	1.0E-06	Conversion Factor (kg/mg)
	FI = :	1	Fraction from contaminated source (unitless)
	EF = :	20	Exposure Frequency (days/year)
	ED = :	6	Exposure Duration (years)
	BW = :	31	Body Weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	2,190	Averaging time for noncarcinogenic exposures (days)

Unit Dose		
Lifetime Chronic Daily Int	1.5E-08	kg-soil/kg-wt/day
Chronic Daily Intake = :	1.8E-07	kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CHILD - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	9.3	1.4E-07	1.6E-06	7.30E-01	NA	1.0E-07	2.0%	NA	NA
Benzo(a)pyrene	9.8	1.5E-07	1.7E-06	7.30E+00	NA	1.1E-06	21.0%	NA	NA
Benzo(b)fluoranthene	11	1.7E-07	1.9E-06	7.30E-01	NA	1.2E-07	2.4%	NA	NA
Dibenzo(a,h)anthracene	8.8	1.3E-07	1.6E-06	7.30E+00	NA	9.7E-07	18.9%	NA	NA
Indeno(1,2,3-cd)pyrene	9.4	1.4E-07	1.7E-06	7.30E-01	NA	1.0E-07	2.0%	NA	NA
Aldrin	0.061	9.2E-10	1.1E-08	1.70E+01	3.00E-05	1.6E-08	0.3%	3.6E-04	0.0%
Dieldrin	0.23	3.5E-09	4.1E-08	1.60E+01	5.00E-05	5.6E-08	1.1%	8.1E-04	0.1%
Aroclor 1254	40	6.1E-07	7.1E-06	NA	2.00E-05	NA	NA	3.5E-01	35.6%
Aroclor, total	70	1.1E-06	1.2E-05	2.00E+00	2.00E-05	2.1E-06	41.1%	6.2E-01	62.3%
Antimony	3.1	4.7E-08	5.5E-07	NA	4.00E-04	NA	NA	1.4E-03	0.1%
Arsenic	22.1	3.3E-07	3.9E-06	1.50E+00	3.00E-04	5.0E-07	9.7%	1.3E-02	1.3%
Chromium (total)	170	2.6E-06	3.0E-05	NA	2.00E-02	NA	NA	1.5E-03	0.2%
Thallium	3.5	5.3E-08	6.2E-07	NA	6.60E-04	NA	NA	9.4E-04	0.1%
Vanadium	105	1.6E-06	1.9E-05	NA	7.00E-03	NA	NA	2.7E-03	0.3%
TEQ-Dioxin/Furan	0.000036	5.5E-13	6.4E-12	1.50E+05	NA	8.2E-08	1.6%	NA	NA
					Total	**5.2E-06**	**100%**	**9.9E-01**	**100%**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CHILD - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:	Cs = :		Concentration in soil (mg/kg)
	CF = :	1.0E-06	Conversion factor (kg/mg)
	SA = :	3,200	Skin surface available for contact (cm^2/event)
	AF = :	1.0	Soil to skin adherence factor (mg/cm^2)
	ABS = :		Absorption factor (unitless)
	EF = :	20	Exposure frequency (events/year)
	ED = :	6	Exposure duration (years)
	BW = :	31	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	2,190	Averaging time for noncarcinogenic exposures (days)

Unit Dose		
Lifetime Chronic Daily Intake	4.8E-07	kg-soil/kg-wt/day
Chronic Daily Intake = :	5.7E-06	kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CHILD - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	9.3	0.13	5.86E-07	6.84E-06	7.30E-01	NA	4.3E-07	2.1%	NA	NA
Benzo(a)pyrene	9.8	0.13	6.18E-07	7.21E-06	7.30E+00	NA	4.5E-06	22.6%	NA	NA
Benzo(b)fluoranthene	11	0.13	6.93E-07	8.09E-06	7.30E-01	NA	5.1E-07	2.5%	NA	NA
Dibenzo(a,h)anthracene	8.8	0.13	5.55E-07	6.47E-06	7.30E+00	NA	4.0E-06	20.3%	NA	NA
Indeno(1,2,3-cd)pyrene	9.4	0.13	5.92E-07	6.91E-06	7.30E-01	NA	4.3E-07	2.2%	NA	NA
Aldrin	0.061	NA	NA	NA	1.70E+01	3.00E-05	NA	NA	NA	NA
Dieldrin	0.23	NA	NA	NA	1.60E+01	5.00E-05	NA	NA	NA	NA
Aroclor, total	70	0.14	4.75E-06	5.54E-05	2.00E+00	2.00E-05	9.5E-06	47.5%	2.8E+00	99.6%
Antimony	3.1	NA	NA	NA	NA	6.00E-05	NA	NA	NA	NA
Arsenic	22.1	0.03	3.21E-07	3.75E-06	1.50E+00	3.00E-04	4.8E-07	2.4%	1.3E-02	0.4%
Chromium (total)	170	NA	NA	NA	NA	5.00E-04	NA	NA	NA	NA
Thallium	3.5	NA	NA	NA	NA	6.60E-04	NA	NA	NA	NA
Vanadium	105	NA	NA	NA	NA	1.80E-04	NA	NA	NA	NA
TEQ-Dioxin/Furan	0.000036	0.03	5.24E-13	6.11E-12	1.50E+05	NA	7.9E-08	0.4%	NA	NA
						Total	**2.0E-05**	**100%**	**2.8E+00**	**100%**

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT CHILD - RME
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
Benzo(a)anthracene	1.0E-07	4.3E-07	NA	5.3E-07	2.1%	NA	NA	NA	NA	NA
Benzo(a)pyrene	1.1E-06	4.5E-06	NA	5.6E-06	22.2%	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.2E-07	5.1E-07	NA	6.3E-07	2.5%	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	9.7E-07	4.0E-06	NA	5.0E-06	20.0%	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.0E-07	4.3E-07	NA	5.4E-07	2.1%	NA	NA	NA	NA	NA
Aldrin	1.6E-08	NA	NA	1.6E-08	0.1%	3.6E-04	NA	NA	3.6E-04	0.0%
Dieldrin	5.6E-08	NA	NA	5.6E-08	0.2%	8.1E-04	NA	NA	8.1E-04	0.0%
Aroclor, total	2.1E-06	9.5E-06	NA	1.2E-05	46.2%	6.2E-01	2.8E+00	NA	3.4E+00	99.0%
Antimony	NA	NA	NA	NA	NA	1.4E-03	NA	NA	1.4E-03	0.0%
Arsenic	5.0E-07	4.8E-07	NA	9.8E-07	3.9%	1.3E-02	1.3E-02	NA	2.6E-02	0.7%
Chromium (total)	NA	NA	NA	NA	NA	1.5E-03	NA	NA	1.5E-03	0.0%
Thallium	NA	NA	NA	NA	NA	9.4E-04	NA	NA	9.4E-04	0.0%
Vanadium	NA	NA	NA	NA	NA	2.7E-03	NA	NA	2.7E-03	0.1%
TEQ-Dioxin/Furan	8.2E-08	7.9E-08	NA	1.6E-07	0.6%	NA	NA	NA	NA	NA
Total	**5.2E-06**	**2.0E-05**	**NA**	**2.5E-05**	**100.0%**	**6.4E-01**	**2.8E+00**	**NA**	**3.4E+00**	**100.0%**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PREADOLESCENT CHILD - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

WHERE:	Cs = :		Concentration in soil (mg/kg)
	IR = :	50	Soil Ingestion Rate (mg/day)
	CF = :	1.0E-06	Conversion Factor (kg/mg)
	FI = :	1	Fraction from contaminated source (unitless)
	EF = :	20	Exposure Frequency (days/year)
	ED = :	2	Exposure Duration (years)
	BW = :	31	Body Weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	730	Averaging time for noncarcinogenic exposures (days)

Unit Dose		
Lifetime Chronic Daily Int	2.5E-09	kg-soil/kg-wt/day
Chronic Daily Intake = :	8.8E-08	kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PREADOLESCENT CHILD - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.3	3.3E-09	1.1E-07	7.30E-01	NA	2.4E-09	1.7%	NA	NA
Benzo(a)pyrene	1.4	3.5E-09	1.2E-07	7.30E+00	NA	2.6E-08	17.8%	NA	NA
Benzo(b)fluoranthene	1.8	4.5E-09	1.6E-07	7.30E-01	NA	3.3E-09	2.3%	NA	NA
Dibenzo(a,h)anthracene	1.2	3.0E-09	1.1E-07	7.30E+00	NA	2.2E-08	15.3%	NA	NA
Indeno(1,2,3-cd)pyrene	1.3	3.3E-09	1.1E-07	7.30E-01	NA	2.4E-09	1.7%	NA	NA
Aldrin	0.01	2.5E-11	8.8E-10	1.70E+01	3.00E-05	4.3E-10	0.3%	2.9E-05	0.0%
Dieldrin	0.028	7.1E-11	2.5E-09	1.60E+01	5.00E-05	1.1E-09	0.8%	4.9E-05	0.1%
Aroclor, total	15	3.8E-08	1.3E-06	1.00E+00	2.00E-05	3.8E-08	26.2%	6.6E-02	82.0%
Antimony	2.1	5.3E-09	1.9E-07	NA	4.00E-04	NA	NA	4.6E-04	0.6%
Arsenic	11.8	3.0E-08	1.0E-06	1.50E+00	3.00E-04	4.5E-08	30.9%	3.5E-03	4.3%
Chromium (total)	70.5	1.8E-07	6.2E-06	NA	2.00E-02	NA	NA	3.1E-04	0.4%
Thallium	1.8	4.5E-09	1.6E-07	NA	6.60E-04	NA	NA	2.4E-04	0.3%
Vanadium	68	1.7E-07	6.0E-06	NA	6.00E-04	NA	NA	1.0E-02	12.4%
TEQ-Dioxin/Furan	0.000012	3.0E-14	1.1E-12	1.50E+05	NA	4.5E-09	3.1%	NA	NA
					Total	**1.4E-07**	**100%**	**8.1E-02**	**100%**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PREADOLESCENT CHILD - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:	Cs = :		Concentration in soil (mg/kg)
	CF = :	1.0E-06	Conversion factor (kg/mg)
	SA = :	3,200	Skin surface available for contact (cm^2/event)
	AF = :	0.20	Soil to skin adherence factor (mg/cm^2)
	ABS = :		Absorption factor (unitless)
	EF = :	20	Exposure frequency (events/year)
	ED = :	2	Exposure duration (years)
	BW = :	31	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	730	Averaging time for noncarcinogenic exposures (days)

Unit Dose		
Lifetime Chronic Daily Intake	3.2E-08	kg-soil/kg-wt/day
Chronic Daily Intake = :	1.1E-06	kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PREADOLESCENT CHILD - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Benzo(a)anthracene	1.3	0.13	5.46E-09	1.91E-07	7.30E-01	NA	4.0E-09	2.2%	NA	NA
Benzo(a)pyrene	1.4	0.13	5.88E-09	2.06E-07	7.30E+00	NA	4.3E-08	23.9%	NA	NA
Benzo(b)fluoranthene	1.8	0.13	7.56E-09	2.65E-07	7.30E-01	NA	5.5E-09	3.1%	NA	NA
Dibenzo(a,h)anthracene	1.2	0.13	5.04E-09	1.76E-07	7.30E+00	NA	3.7E-08	20.4%	NA	NA
Indeno(1,2,3-cd)pyrene	1.3	0.13	5.46E-09	1.91E-07	7.30E-01	NA	4.0E-09	2.2%	NA	NA
Aldrin	0.01	NA	NA	NA	1.70E+01	3.00E-05	NA	NA	NA	NA
Dieldrin	0.028	NA	NA	NA	1.60E+01	5.00E-05	NA	NA	NA	NA
Aroclor, total	15	0.14	6.79E-08	2.38E-06	1.00E+00	2.00E-05	6.8E-08	37.7%	1.2E-01	98.9%
Antimony	2.1	NA	NA	NA	NA	6.00E-05	NA	NA	NA	NA
Arsenic	11.8	0.03	1.14E-08	4.00E-07	1.50E+00	3.00E-04	1.7E-08	9.5%	1.3E-03	1.1%
Chromium (total)	70.5	NA	NA	NA	NA	5.00E-04	NA	NA	NA	NA
Thallium	1.8	NA	NA	NA	NA	6.60E-04	NA	NA	NA	NA
Vanadium	68	NA	NA	NA	NA	1.80E-04	NA	NA	NA	NA
TEQ-Dioxin/Furan	0.000012	0.03	1.16E-14	4.07E-13	1.50E+05	NA	1.7E-09	1.0%	NA	NA
						Total	**1.8E-07**	**100%**	1.2E-01	**100%**

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PREADOLESCENT CHILD - CTE
MEDIA: SURFACE SOIL
DATE: AUGUST 31, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
Benzo(a)anthracene	2.4E-09	4.0E-09	NA	6.4E-09	2.0%	NA	NA	NA	NA	NA
Benzo(a)pyrene	2.6E-08	4.3E-08	NA	6.9E-08	21.2%	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	3.3E-09	5.5E-09	NA	8.8E-09	2.7%	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	2.2E-08	3.7E-08	NA	5.9E-08	18.1%	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.4E-09	4.0E-09	NA	6.4E-09	2.0%	NA	NA	NA	NA	NA
Aldrin	4.3E-10	NA	NA	4.3E-10	0.1%	2.9E-05	NA	NA	2.9E-05	0.0%
Dieldrin	1.1E-09	NA	NA	1.1E-09	0.3%	4.9E-05	NA	NA	4.9E-05	0.0%
Aroclor, total	3.8E-08	6.8E-08	NA	1.1E-07	32.6%	6.6E-02	1.2E-01	NA	1.9E-01	92.1%
Antimony	NA	NA	NA	NA	NA	4.6E-04	NA	NA	4.6E-04	0.2%
Arsenic	4.5E-08	1.7E-08	NA	6.2E-08	19.0%	3.5E-03	1.3E-03	NA	4.8E-03	2.4%
Chromium (total)	NA	NA	NA	NA	NA	3.1E-04	NA	NA	3.1E-04	0.2%
Thallium	NA	NA	NA	NA	NA	2.4E-04	NA	NA	2.4E-04	0.1%
Vanadium	NA	NA	NA	NA	NA	1.0E-02	NA	NA	1.0E-02	5.0%
TEQ-Dioxin/Furan	4.5E-09	1.7E-09	NA	6.3E-09	1.9%	NA	NA	NA	NA	NA
Total	**1.4E-07**	**1.8E-07**	**NA**	**3.2E-07**	**100.0%**	**8.1E-02**	**1.2E-01**	**NA**	**2.0E-01**	**100.0%**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DA_{event} \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics $DA_{event} = Kp \times Cw \times CF \times t_{event}$

For Organics If $t_{event} \le t^*$, then : $DA_{event} = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times t_{event}}{\pi}}$

If $t_{event} > t^*$, then : $DA_{event} = Kp \times Cw \times CF \times \left[\frac{t_{event}}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

Where:	SA = :	4,500	Skin surface available for contact (cm^2)
	DAevent = :		Chemical specific absorbed dose per event (mg/cm^2-event)
	EV = :	1	Event frequency (events/days)
	EF = :	20	Exposure frequency (days/year)
	ED = :	24	Exposure duration (years)
	BW = :	70	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	8,760	Averaging time for noncarcinogenic exposures (days)
	CF = :	0.001	Conversion Factor (L/m^3)
	Kp =:		Chemical specific permeability coefficient (cm/hr)
	Cw = :		Concentration of chemical in water (mg/L)
	tevent = :	1	duration of event (hr/event)
	tau = :		Chemical specific lag time (hr)
	t* = :		Chemical specific time it takes to reach steady state (hr)
	B = :		Chemical specific dimensionless constant
	Dsc = :		Effective diffusivity for chemical transfer through skin (cm^2/hr)
	b, c = :		chemical specific constants

Unit Dose

Lifetime Chronic Daily Intake =	1.2E+00	cm^2-event/(kg-day)
Chronic Daily Intake = :	3.5E+00	cm^2-event/(kg-day)

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

CHEMICAL	Cw (mg/L)	Organic or Inorganic	Molecular Weight	Estimated Kp (cm/hr)	tau-event (hr)	B	b	c	Dsc (cm^2/hr)	t* (hr)	DAevent (mg/cm^2 - event)
alpha-Chlordane	0.00009	O	409.78	4.60E-02	2.07E+01	3.58E-01	5.71E-01	6.04E-01	8.04E-09	4.97E+01	5.21E-08
Aroclor, total	0.007	O	292	9.00E-01	4.53E+00	5.92E+00	2.45E+01	5.96E+00	3.67E-08	2.01E+01	3.71E-05
gamma-Chlordane	0.000013	O	409.78	4.60E-02	2.07E+01	3.58E-01	5.71E-01	6.04E-01	8.04E-09	4.97E+01	7.52E-09
Heptachlor Epoxide	0.000032	O	389.3	1.10E-02	1.59E+01	8.35E-02	3.56E-01	3.91E-01	1.05E-08	3.81E+01	3.88E-09
Arsenic	0.0429	I	74.9	1.00E-03	2.76E-01	3.33E-03	3.05E-01	3.36E-01	6.03E-07	6.62E-01	4.29E-08
Cadmium	0.0023	I	112.41	1.00E-03	4.47E-01	4.08E-03	3.06E-01	3.36E-01	3.72E-07	1.07E+00	2.30E-09
Chromium (total)	0.101	I	51.99	1.00E-03	2.05E-01	2.77E-03	3.05E-01	3.35E-01	8.11E-07	4.93E-01	1.01E-07
Manganese	0.882	I	54.94	1.00E-03	2.13E-01	2.85E-03	3.05E-01	3.35E-01	7.80E-07	5.12E-01	8.82E-07
Vanadium	0.152	I	50.64	1.00E-03	2.02E-01	2.74E-03	3.05E-01	3.35E-01	8.25E-07	4.84E-01	1.52E-07

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

CHEMICAL	DAevent (mg/cm^2 - event)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
alpha-Chlordane	5.21E-08	6.29E-08	1.83E-07	3.50E-01	5.00E-04	2.2E-08	0.0%	3.7E-04	0.0%
Aroclor, total	3.71E-05	4.48E-05	1.31E-04	2.00E+00	2.00E-05	9.0E-05	99.8%	6.5E+00	99.9%
gamma-Chlordane	7.52E-09	9.08E-09	2.65E-08	3.50E-01	5.00E-04	3.2E-09	0.0%	5.3E-05	0.0%
Heptachlor Epoxide	3.88E-09	4.68E-09	1.37E-08	9.10E+00	1.30E-04	4.3E-08	0.0%	1.1E-04	0.0%
Arsenic	4.29E-08	5.18E-08	1.51E-07	1.50E+00	3.00E-04	7.8E-08	0.1%	5.0E-04	0.0%
Cadmium	2.30E-09	2.78E-09	8.10E-09	NA	2.50E-05	NA	NA	3.2E-04	0.0%
Chromium (total)	1.01E-07	1.22E-07	3.56E-07	NA	7.50E-05	NA	NA	4.7E-03	0.1%
Manganese	8.82E-07	1.07E-06	3.11E-06	NA	1.40E-03	NA	NA	2.2E-03	0.0%
Vanadium	1.52E-07	1.84E-07	5.35E-07	NA	1.80E-04	NA	NA	3.0E-03	0.0%
					Total	**9.0E-05**	**100.0%**	**6.5E+00**	**100.0%**

RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
alpha-Chlordane	NA	2.2E-08	NA	2.2E-08	0.0%	NA	3.7E-04	NA	3.7E-04	0.0%
Aroclor, total	NA	9.0E-05	NA	9.0E-05	99.8%	NA	6.5E+00	NA	6.5E+00	99.9%
gamma-Chlordane	NA	3.2E-09	NA	3.2E-09	0.0%	NA	5.3E-05	NA	5.3E-05	0.0%
Heptachlor Epoxide	NA	4.3E-08	NA	4.3E-08	0.0%	NA	1.1E-04	NA	1.1E-04	0.0%
Arsenic	NA	7.8E-08	NA	7.8E-08	0.1%	NA	5.0E-04	NA	5.0E-04	0.0%
Cadmium	NA	NA	NA	NA	NA	NA	3.2E-04	NA	3.2E-04	0.0%
Chromium (total)	NA	NA	NA	NA	NA	NA	4.7E-03	NA	4.7E-03	0.1%
Manganese	NA	NA	NA	NA	NA	NA	2.2E-03	NA	2.2E-03	0.0%
Vanadium	NA	NA	NA	NA	NA	NA	3.0E-03	NA	3.0E-03	0.0%
Total	NA	**9.0E-05**	**NA**	**9.0E-05**	**100.0%**	NA	**6.5E+00**	**NA**	**6.5E+00**	**100.0%**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DA_{event} \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics $DA_{event} = Kp \times Cw \times CF \times t_{event}$

For Organics If $t_{event} \le t^*$, then : $DA_{event} = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times t_{event}}{\pi}}$

If $t_{event} > t^*$, then : $DA_{event} = Kp \times Cw \times CF \times \left[\frac{t_{event}}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

Where:	SA = :	4,500	Skin surface available for contact (cm^2)
	DAevent = :		Chemical specific absorbed dose per event (mg/cm^2-event)
	EV = :	1	Event frequency (events/days)
	EF = :	20	Exposure frequency (days/year)
	ED = :	7	Exposure duration (years)
	BW = :	70	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	2,555	Averaging time for noncarcinogenic exposures (days)
	CF = :	0.001	Conversion Factor (L/m^3)
	Kp =:		Chemical specific permeability coefficient (cm/hr)
	Cw = :		Concentration of chemical in water (mg/L)
	tevent = :	1	duration of event (hr/event)
	tau = :		Chemical specific lag time (hr)
	t* = :		Chemical specific time it takes to reach steady state (hr)
	B = :		Chemical specific dimensionless constant
	Dsc = :		Effective diffusivity for chemical transfer through skin (cm^2/hr)
	b, c = :		chemical specific constants

Unit Dose

Lifetime Chronic Daily Intake =	3.5E-01	cm^2-event/(kg-day)
Chronic Daily Intake = :	3.5E+00	cm^2-event/(kg-day)

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

CHEMICAL	Cw (mg/L)	Organic or Inorganic	Molecular Weight	Estimated Kp (cm/hr)	tau-event (hr)	B	b	c	Dsc (cm^2/hr)	t* (hr)	DAevent (mg/cm^2 - event)
alpha-Chlordane	0.000032	O	409.78	4.60E-02	2.07E+01	3.58E-01	5.71E-01	6.04E-01	8.04E-09	4.97E+01	1.85E-08
Aroclor, total	0.0039	O	292	9.00E-01	4.53E+00	5.92E+00	2.45E+01	5.96E+00	3.67E-08	2.01E+01	2.07E-05
gamma-Chlordane	0.000013	O	409.78	4.60E-02	2.07E+01	3.58E-01	5.71E-01	6.04E-01	8.04E-09	4.97E+01	7.52E-09
Heptachlor Epoxide	0.000026	O	389.3	1.10E-02	1.59E+01	8.35E-02	3.56E-01	3.91E-01	1.05E-08	3.81E+01	3.15E-09
Arsenic	0.0134	I	74.9	1.00E-03	2.76E-01	3.33E-03	3.05E-01	3.36E-01	6.03E-07	6.62E-01	1.34E-08
Cadmium	0.0013	I	112.41	1.00E-03	4.47E-01	4.08E-03	3.06E-01	3.36E-01	3.72E-07	1.07E+00	1.30E-09
Chromium (total)	0.0243	I	51.99	1.00E-03	2.05E-01	2.77E-03	3.05E-01	3.35E-01	8.11E-07	4.93E-01	2.43E-08
Manganese	0.651	I	54.94	1.00E-03	2.13E-01	2.85E-03	3.05E-01	3.35E-01	7.80E-07	5.12E-01	6.51E-07
Vanadium	0.0373	I	50.64	1.00E-03	2.02E-01	2.74E-03	3.05E-01	3.35E-01	8.25E-07	4.84E-01	3.73E-08

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

CHEMICAL	DAevent (mg/cm^2 - event)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
alpha-Chlordane	1.85E-08	6.52E-09	6.52E-08	3.50E-01	5.00E-04	2.3E-09	0.0%	1.3E-04	0.0%
Aroclor, total	2.07E-05	7.28E-06	7.28E-05	1.00E+00	2.00E-05	7.3E-06	99.7%	3.6E+00	99.9%
gamma-Chlordane	7.52E-09	2.65E-09	2.65E-08	3.50E-01	5.00E-04	9.3E-10	0.0%	5.3E-05	0.0%
Heptachlor Epoxide	3.15E-09	1.11E-09	1.11E-08	9.10E+00	1.30E-05	1.0E-08	0.1%	8.5E-04	0.0%
Arsenic	1.34E-08	4.72E-09	4.72E-08	1.50E+00	3.00E-04	7.1E-09	0.1%	1.6E-04	0.0%
Cadmium	1.30E-09	4.58E-10	4.58E-09	NA	2.50E-05	NA	NA	1.8E-04	0.0%
Chromium (total)	2.43E-08	8.56E-09	8.56E-08	NA	7.50E-05	NA	NA	1.1E-03	0.0%
Manganese	6.51E-07	2.29E-07	2.29E-06	NA	1.40E-03	NA	NA	1.6E-03	0.0%
Vanadium	3.73E-08	1.31E-08	1.31E-07	NA	1.80E-04	NA	NA	7.3E-04	0.0%
					Total	**7.3E-06**	**100.0%**	**3.6E+00**	**100.0%**

RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
alpha-Chlordane	NA	2.3E-09	NA	2.3E-09	0.0%	NA	1.3E-04	NA	1.3E-04	0.0%
Aroclor, total	NA	7.3E-06	NA	7.3E-06	99.7%	NA	3.6E+00	NA	3.6E+00	99.9%
gamma-Chlordane	NA	9.3E-10	NA	9.3E-10	0.0%	NA	5.3E-05	NA	5.3E-05	0.0%
Heptachlor Epoxide	NA	1.0E-08	NA	1.0E-08	0.1%	NA	8.5E-04	NA	8.5E-04	0.0%
Arsenic	NA	7.1E-09	NA	7.1E-09	0.1%	NA	1.6E-04	NA	1.6E-04	0.0%
Cadmium	NA	NA	NA	NA	NA	NA	1.8E-04	NA	1.8E-04	0.0%
Chromium (total)	NA	NA	NA	NA	NA	NA	1.1E-03	NA	1.1E-03	0.0%
Manganese	NA	NA	NA	NA	NA	NA	1.6E-03	NA	1.6E-03	0.0%
Vanadium	NA	NA	NA	NA	NA	NA	7.3E-04	NA	7.3E-04	0.0%
Total	NA	**7.3E-06**	**NA**	**7.3E-06**	**100.0%**	NA	**3.6E+00**	**NA**	**3.6E+00**	**100.0%**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT - RME
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DA_{event} \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics $DA_{event} = Kp \times Cw \times CF \times t_{event}$

For Organics If $t_{event} \le t^*$, then : $DA_{event} = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times t_{event}}{\pi}}$

If $t_{event} > t^*$, then : $DA_{event} = Kp \times Cw \times CF \times \left[\frac{t_{event}}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

Where:	SA = :	2,500	Skin surface available for contact (cm^2)
	DAevent = :		Chemical specific absorbed dose per event (mg/cm^2-event)
	EV = :	1	Event frequency (events/days)
	EF = :	20	Exposure frequency (days/year)
	ED = :	6	Exposure duration (years)
	BW = :	31	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	2,190	Averaging time for noncarcinogenic exposures (days)
	CF = :	0.001	Conversion Factor (L/m^3)
	Kp =:		Chemical specific permeability coefficient (cm/hr)
	Cw = :		Concentration of chemical in water (mg/L)
	tevent = :	1	duration of event (hr/event)
	tau = :		Chemical specific lag time (hr)
	t* = :		Chemical specific time it takes to reach steady state (hr)
	B = :		Chemical specific dimensionless constant
	Dsc = :		Effective diffusivity for chemical transfer through skin (cm^2/hr)
	b, c = :		chemical specific constants

Unit Dose

Lifetime Chronic Daily Intake =	3.8E-01	cm^2-event/(kg-day)
Chronic Daily Intake = :	4.4E+00	cm^2-event/(kg-day)

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT - RME
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

CHEMICAL	Cw (mg/L)	Organic or Inorganic	Molecular Weight	Estimated Kp (cm/hr)	tau-event (hr)	B	b	c	Dsc (cm^2/hr)	t* (hr)	DAevent (mg/cm^2 - event)
alpha-Chlordane	0.00009	O	409.78	4.60E-02	2.07E+01	3.58E-01	5.71E-01	6.04E-01	8.04E-09	4.97E+01	5.21E-08
Aroclor, total	0.007	O	292	9.00E-01	4.53E+00	5.92E+00	2.45E+01	5.96E+00	3.67E-08	2.01E+01	3.71E-05
gamma-Chlordane	0.000013	O	409.78	4.60E-02	2.07E+01	3.58E-01	5.71E-01	6.04E-01	8.04E-09	4.97E+01	7.52E-09
Heptachlor Epoxide	0.000032	O	389.3	1.10E-02	1.59E+01	8.35E-02	3.56E-01	3.91E-01	1.05E-08	3.81E+01	3.88E-09
Arsenic	0.0429	I	74.9	1.00E-03	2.76E-01	3.33E-03	3.05E-01	3.36E-01	6.03E-07	6.62E-01	4.29E-08
Cadmium	0.0023	I	112.41	1.00E-03	4.47E-01	4.08E-03	3.06E-01	3.36E-01	3.72E-07	1.07E+00	2.30E-09
Chromium (total)	0.101	I	51.99	1.00E-03	2.05E-01	2.77E-03	3.05E-01	3.35E-01	8.11E-07	4.93E-01	1.01E-07
Manganese	0.882	I	54.94	1.00E-03	2.13E-01	2.85E-03	3.05E-01	3.35E-01	7.80E-07	5.12E-01	8.82E-07
Vanadium	0.152	I	50.64	1.00E-03	2.02E-01	2.74E-03	3.05E-01	3.35E-01	8.25E-07	4.84E-01	1.52E-07

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT - RME
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

CHEMICAL	DAevent (mg/cm^2 - event)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
alpha-Chlordane	5.21E-08	1.97E-08	2.30E-07	3.50E-01	5.00E-03	6.9E-09	0.0%	4.6E-05	0.0%
Aroclor, total	3.71E-05	1.40E-05	1.64E-04	2.00E+00	2.00E-05	2.8E-05	99.8%	8.2E+00	99.9%
gamma-Chlordane	7.52E-09	2.85E-09	3.32E-08	3.50E-01	5.00E-03	1.0E-09	0.0%	6.6E-06	0.0%
Heptachlor Epoxide	3.88E-09	1.47E-09	1.71E-08	9.10E+00	1.30E-05	1.3E-08	0.0%	1.3E-03	0.0%
Arsenic	4.29E-08	1.62E-08	1.90E-07	1.50E+00	3.00E-04	2.4E-08	0.1%	6.3E-04	0.0%
Cadmium	2.30E-09	8.71E-10	1.02E-08	NA	2.50E-05	NA	NA	4.1E-04	0.0%
Chromium (total)	1.01E-07	3.83E-08	4.46E-07	NA	5.00E-04	NA	NA	8.9E-04	0.0%
Manganese	8.82E-07	3.34E-07	3.90E-06	NA	1.40E-03	NA	NA	2.8E-03	0.0%
Vanadium	1.52E-07	5.76E-08	6.72E-07	NA	1.80E-04	NA	NA	3.7E-03	0.0%
					Total	**2.8E-05**	**100.0%**	**8.2E+00**	**100.0%**

RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT - RME
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
alpha-Chlordane	NA	6.9E-09	NA	6.9E-09	0.0%	NA	4.6E-05	NA	4.6E-05	0.0%
Aroclor, total	NA	2.8E-05	NA	2.8E-05	99.8%	NA	8.2E+00	NA	8.2E+00	99.9%
gamma-Chlordane	NA	1.0E-09	NA	1.0E-09	0.0%	NA	6.6E-06	NA	6.6E-06	0.0%
Heptachlor Epoxide	NA	1.3E-08	NA	1.3E-08	0.0%	NA	1.3E-03	NA	1.3E-03	0.0%
Arsenic	NA	2.4E-08	NA	2.4E-08	0.1%	NA	6.3E-04	NA	6.3E-04	0.0%
Cadmium	NA	NA	NA	NA	NA	NA	4.1E-04	NA	4.1E-04	0.0%
Chromium (total)	NA	NA	NA	NA	NA	NA	8.9E-04	NA	8.9E-04	0.0%
Manganese	NA	NA	NA	NA	NA	NA	2.8E-03	NA	2.8E-03	0.0%
Vanadium	NA	NA	NA	NA	NA	NA	3.7E-03	NA	3.7E-03	0.0%
Total	NA	**2.8E-05**	**NA**	**2.8E-05**	**100.0%**	NA	**8.2E+00**	**NA**	**8.2E+00**	**100.0%**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH WATER ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATIONS:

$$\text{Absorbed Dose} = \frac{DA_{event} \times EV \times EF \times ED \times SA}{BW \times AT}$$

For Inorganics $DA_{event} = Kp \times Cw \times CF \times t_{event}$

For Organics If $t_{event} \le t^*$, then : $DA_{event} = 2 \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times tau \times t_{event}}{\pi}}$

If $t_{event} > t^*$, then : $DA_{event} = Kp \times Cw \times CF \times \left[\frac{t_{event}}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]$

Where:	SA = :	2,500	Skin surface available for contact (cm^2)
	DA_{event} = :		Chemical specific absorbed dose per event (mg/cm^2-event)
	EV = :	1	Event frequency (events/days)
	EF = :	20	Exposure frequency (days/year)
	ED = :	2	Exposure duration (years)
	BW = :	31	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	730	Averaging time for noncarcinogenic exposures (days)
	CF = :	0.001	Conversion Factor (L/m^3)
	Kp =:		Chemical specific permeability coefficient (cm/hr)
	Cw = :		Concentration of chemical in water (mg/L)
	t_{event} = :	1	duration of event (hr/event)
	tau = :		Chemical specific lag time (hr)
	t^* = :		Chemical specific time it takes to reach steady state (hr)
	B = :		Chemical specific dimensionless constant
	Dsc = :		Effective diffusivity for chemical transfer through skin (cm^2/hr)
	b, c = :		chemical specific constants

Unit Dose

Lifetime Chronic Daily Intake =	1.3E-01	cm^2-event/(kg-day)
Chronic Daily Intake = :	4.4E+00	cm^2-event/(kg-day)

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

CHEMICAL	Cw (mg/L)	Organic or Inorganic	Molecular Weight	Estimated Kp (cm/hr)	tau-event (hr)	B	b	c	Dsc (cm^2/hr)	t* (hr)	DAevent (mg/cm^2 - event)
alpha-Chlordane	0.000032	O	409.78	4.60E-02	2.07E+01	3.58E-01	5.71E-01	6.04E-01	8.04E-09	4.97E+01	1.85E-08
Aroclor, total	0.0039	O	292	9.00E-01	4.53E+00	5.92E+00	2.45E+01	5.96E+00	3.67E-08	2.01E+01	2.07E-05
gamma-Chlordane	0.000013	O	409.78	4.60E-02	2.07E+01	3.58E-01	5.71E-01	6.04E-01	8.04E-09	4.97E+01	7.52E-09
Heptachlor Epoxide	0.000026	O	389.3	1.10E-02	1.59E+01	8.35E-02	3.56E-01	3.91E-01	1.05E-08	3.81E+01	3.15E-09
Arsenic	0.0134	I	74.9	1.00E-03	2.76E-01	3.33E-03	3.05E-01	3.36E-01	6.03E-07	6.62E-01	1.34E-08
Cadmium	0.0013	I	112.41	1.00E-03	4.47E-01	4.08E-03	3.06E-01	3.36E-01	3.72E-07	1.07E+00	1.30E-09
Chromium (total)	0.0243	I	51.99	1.00E-03	2.05E-01	2.77E-03	3.05E-01	3.35E-01	8.11E-07	4.93E-01	2.43E-08
Manganese	0.651	I	54.94	1.00E-03	2.13E-01	2.85E-03	3.05E-01	3.35E-01	7.80E-07	5.12E-01	6.51E-07
Vanadium	0.0373	I	50.64	1.00E-03	2.02E-01	2.74E-03	3.05E-01	3.35E-01	8.25E-07	4.84E-01	3.73E-08

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH WATER (PAGE THREE)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

CHEMICAL	DAevent (mg/cm^2 - event)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
alpha-Chlordane	1.85E-08	2.34E-09	8.18E-08	3.50E-01	5.00E-03	8.2E-10	0.0%	1.6E-05	0.0%
Aroclor, total	2.07E-05	2.61E-06	9.13E-05	1.00E+00	2.00E-05	2.6E-06	99.7%	4.6E+00	99.9%
gamma-Chlordane	7.52E-09	9.49E-10	3.32E-08	3.50E-01	5.00E-03	3.3E-10	0.0%	6.6E-06	0.0%
Heptachlor Epoxide	3.15E-09	3.98E-10	1.39E-08	9.10E+00	1.30E-05	3.6E-09	0.1%	1.1E-03	0.0%
Arsenic	1.34E-08	1.69E-09	5.92E-08	1.50E+00	3.00E-04	2.5E-09	0.1%	2.0E-04	0.0%
Cadmium	1.30E-09	1.64E-10	5.74E-09	NA	2.50E-05	NA	NA	2.3E-04	0.0%
Chromium (total)	2.43E-08	3.07E-09	1.07E-07	NA	5.00E-04	NA	NA	2.1E-04	0.0%
Manganese	6.51E-07	8.22E-08	2.88E-06	NA	1.40E-03	NA	NA	2.1E-03	0.0%
Vanadium	3.73E-08	4.71E-09	1.65E-07	NA	1.80E-04	NA	NA	9.2E-04	0.0%
					Total	**2.6E-06**	**100.0%**	**4.6E+00**	**100.0%**

RISK ASSESSMENT SPREADSHEET - SUMMARY OF CANCER RISKS AND HAZARD INDICES

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - PRE-ADOLESCENT - CTE
MEDIA: SURFACE WATER
DATE: AUGUST 31, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	**Incidental Ingestion**	**Dermal Contact**	**Inhalation**	**Total Risk**	**Percent Risk**	**Incidental Ingestion**	**Dermal Contact**	**Inhalation**	**Total HI**	**Percent HI**
alpha-Chlordane	NA	8.2E-10	NA	8.2E-10	0.0%	NA	1.6E-05	NA	1.6E-05	0.0%
Aroclor, total	NA	2.6E-06	NA	2.6E-06	99.7%	NA	4.6E+00	NA	4.6E+00	99.9%
gamma-Chlordane	NA	3.3E-10	NA	3.3E-10	0.0%	NA	6.6E-06	NA	6.6E-06	0.0%
Heptachlor Epoxide	NA	3.6E-09	NA	3.6E-09	0.1%	NA	1.1E-03	NA	1.1E-03	0.0%
Arsenic	NA	2.5E-09	NA	2.5E-09	0.1%	NA	2.0E-04	NA	2.0E-04	0.0%
Cadmium	NA	NA	NA	NA	NA	NA	2.3E-04	NA	2.3E-04	0.0%
Chromium (total)	NA	NA	NA	NA	NA	NA	2.1E-04	NA	2.1E-04	0.0%
Manganese	NA	NA	NA	NA	NA	NA	2.1E-03	NA	2.1E-03	0.0%
Vanadium	NA	NA	NA	NA	NA	NA	9.2E-04	NA	9.2E-04	0.0%
Total	NA	**2.6E-06**	**NA**	**2.6E-06**	**100.0%**	NA	**4.6E+00**	**NA**	**4.6E+00**	**100.0%**

Appendix F.11

Results of IEUBK and Adult Models for Lead Exposures

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SURFACE SOILS- REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/maternal} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\ 0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [1]	997	997	997	997	997
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.100	0.100	0.100	0.100	0.100
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	250	250	250	250	250
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\ central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	4.98	4.98	5.48	5.48	5.28
$PbB_{fetal,\ GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	4.48	4.48	4.93	4.93	4.75
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	8.60%	13.96%	11.44%	17.02%	14.14%
$PbB_{fetal,\ 0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	11.78	15.18	12.97	16.71	14.86
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	768	480	616	328	472

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SURFACE SOILS- CENTRAL TENDENCY EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [1]	997	997	997	997	997
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050	0.050	0.050	0.050	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	250	250	250	250	250
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\,central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	**3.34**	**3.34**	**3.84**	**3.84**	**3.64**
$PbB_{fetal,\,GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	**3.01**	**3.01**	**3.46**	**3.46**	**3.28**
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	**2.04%**	**5.26%**	**3.53%**	**7.60%**	**5.37%**
$PbB_{fetal,\,0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	**7.90**	**10.18**	**9.09**	**11.71**	**10.24**
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	**1536**	**960**	**1232**	**656**	**945**

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SOILS 0-15 FEET- REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [1]	2880	2880	2880	2880	2880
BKSF	Biokinetic slope factor (ug/dL per ug/day)	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.100	0.100	0.100	0.100	0.100
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	250	250	250	250	250
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\,central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	**11.17**	**11.17**	**11.67**	**11.67**	**11.47**
$PbB_{fetal,\,GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	**10.05**	**10.05**	**10.50**	**10.50**	**10.32**
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	**50.35%**	**50.28%**	**53.32%**	**52.63%**	**51.82%**
$PbB_{fetal,\,0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	**26.43**	**34.06**	**27.62**	**35.59**	**32.28**
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	**768**	**480**	**616**	**328**	**472**

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SOILS 0-15 FEET- CENTRAL TENDENCY EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/matemal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [1]	2880	2880	2880	2880	2880
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050	0.050	0.050	0.050	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	250	250	250	250	250
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/matemal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\,central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	**6.43**	**6.43**	**6.93**	**6.93**	**6.73**
$PbB_{fetal,\,GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	**5.79**	**5.79**	**6.24**	**6.24**	**6.06**
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	**17.63%**	**23.08%**	**21.12%**	**26.26%**	**23.50%**
$PbB_{fetal,\,0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	**15.23**	**19.62**	**16.41**	**21.15**	**18.96**
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	**1536**	**960**	**1232**	**656**	**945**

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER - REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST $((\ln(10)-\ln(PbS))/\ln(GSD_i))$

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [(1)]	506	506	506	506	506
BKSF	Biokinetic slope factor (ug/dL per ug/day)	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.100	0.100	0.100	0.100	0.100
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	150	150	150	150	150
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\,central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	2.70	2.70	3.20	3.20	3.00
$PbB_{fetal,\,GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	2.43	2.43	2.88	2.88	2.70
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	0.80%	2.82%	1.71%	4.66%	2.94%
$PbB_{fetal,\,0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	6.39	8.23	7.57	9.75	8.44
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	1280	800	1027	547	787

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[(1)] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER - CENTRAL TENDENCY EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [1]	506	506	506	506	506
BKSF	Biokinetic slope factor (ug/dL per ug/day)	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050	0.050	0.050	0.050	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	150	150	150	150	150
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\,central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	**2.20**	**2.20**	**2.70**	**2.70**	**2.50**
$PbB_{fetal,\,GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	**1.98**	**1.98**	**2.43**	**2.43**	**2.25**
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	**0.29%**	**1.45%**	**0.80%**	**2.82%**	**1.57%**
$PbB_{fetal,\,0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	**5.20**	**6.71**	**6.39**	**8.23**	**7.03**
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	**2560**	**1601**	**2053**	**1094**	**1574**

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

TETRA TECH NUS, INC. CALCULATION WORKSHEET PAGE ____ OF ____

CLIENT	JOB NUMBER	
EPA Region I	7491	Area III
SUBJECT: Evaluation of Frequent Recreational User - Via IEUBK		
BASED ON	DRAWING NUMBER	
BY: L. A. Sinagoga	CHECKED BY: J. M. Malle	APPROVED BY:	DATE: 3/16/00

Objective: Develop lead exposure point concentrations to be evaluated assuming a recreational land use scenario and using the EPA IEUBK model.

Relevant Equation:

$$PbS_w = EF_{site} \cdot [(F_{site} \cdot PbS_{site}) + (F_{yard} \cdot PbS_{yard})] + (EF_{yard} \cdot PbS_{yard})$$

PbS_w (mg/kg) = Time-weighted soil concentration

EF_{site} ($\frac{days}{days\ of\ wk}$) = Fraction of days/week site is visited (Assume $\frac{3\ days}{7\ days}$)

F_{site} (fraction) = Fraction of daily outdoor time spent at the site on days when the site is visited (dimensionless). (Assume 0.5)

PbS_{site} (mg/kg) = Average soil lead concentration at an exposure unit on the site (mg/kg).

F_{yard} ($\frac{days}{days\ per\ wk}$) = Fraction of daily outdoor time at local background soil lead level (usually near home) = 1 - F_{site} (Assume 0.5)

PbS_{yard} (mg/kg) = Average soil lead concentration near home.

EF_{yard} ($\frac{days}{days/wk}$) = Fraction of the days/week child does not visit the site during the exposure period = 1 - EF_{site} ($\frac{4\ days}{7\ days}$)

Assume PbS_{site} = 506 mg/kg ; PbS_{yard} = 200 mg/kg

$$PbS_w = \frac{3d}{7d} \times [(0.5 \times 506\ mg/kg) + (0.5 \times 200\ mg/kg)] + \left(\frac{4}{7} \times 200\ mg/kg\right) = 266\ mg/kg$$

IEUBK MODEL - EXPOSURE,TO LEAD
SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER
DATE: MARCH 16, 2000

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	266.0	200.0
1-2	266.0	200.0
2-3	266.0	200.0
3-4	266.0	200.0
4-5	266.0	200.0
5-6	266.0	200.0
6-7	266.0	200.0

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

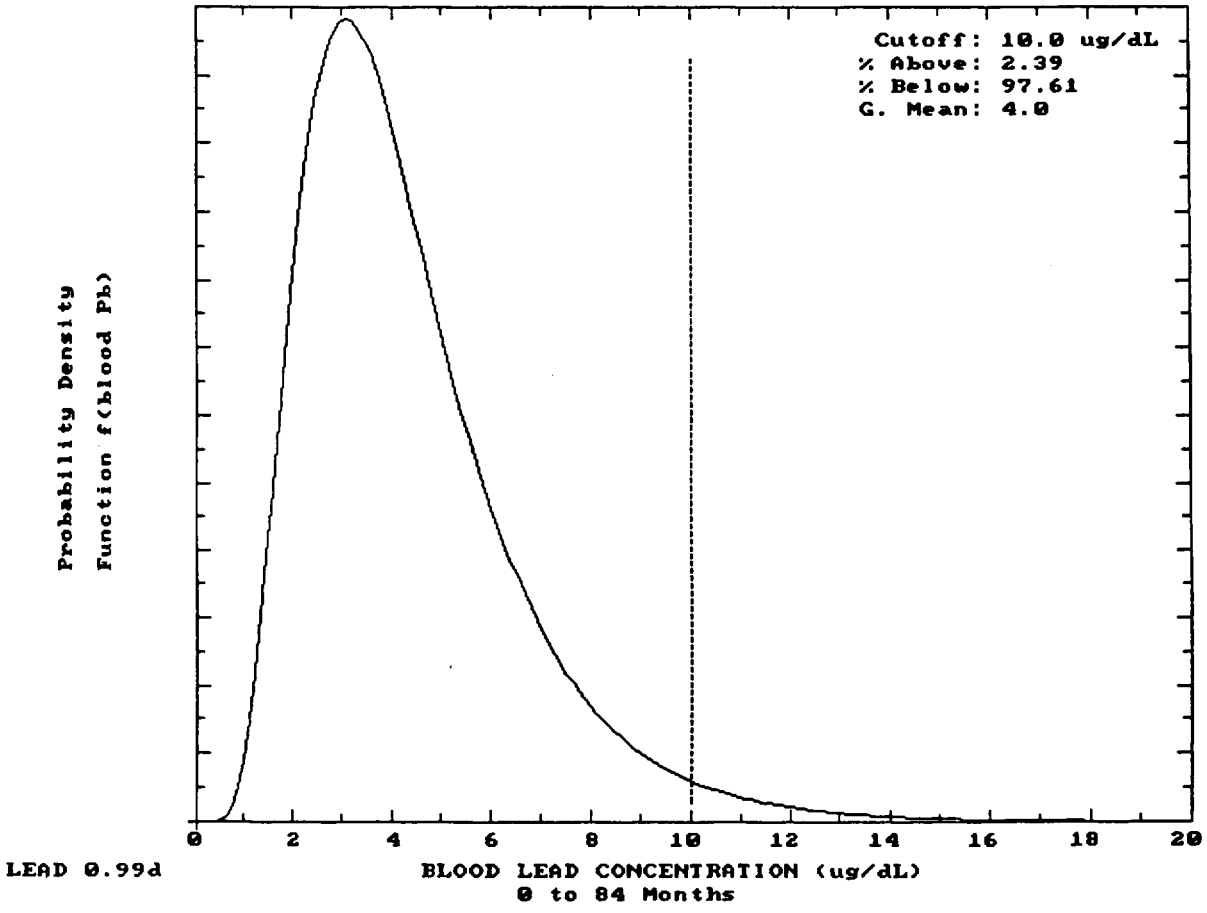
MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	4.4	8.23	5.33
1-2:	4.9	11.91	8.38
2-3:	4.6	12.44	8.48
3-4:	4.4	12.52	8.59
4-5:	3.7	10.45	6.51
5-6:	3.2	10.12	5.91
6-7:	2.9	10.17	5.60

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.52	0.36	0.00	0.02
1-2:	2.60	0.90	0.00	0.03
2-3:	2.96	0.95	0.00	0.06
3-4:	2.88	0.98	0.00	0.07
4-5:	2.84	1.04	0.00	0.07
5-6:	3.02	1.10	0.00	0.09
6-7:	3.35	1.13	0.00	0.09

IEUBK MODEL - EXPOSURE TO LEAD
SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER
DATE: MARCH 16, 2000



Lead Hotspots

TABLE F-11.1
LEAD HOTSPOT SAMPLES
CURRENT/FUTURE
COMMERCIAL WORKERS
SURFACE SOIL (0-2 FEET BGS)
AREA D

AOC	MATRIX	BORING	SAMPLE NAME	PARAMETER	RESULT	QUAL	UNITS
D	SOIL	BPM A+09	BPM A+09	Lead	5170		MG/KG
D	SOIL	BPM A+50	BPM A+50	Lead	1670		MG/KG
D	SOIL	BPMB+50	BPMB+50	Lead	1750		MG/KG
D	SOIL	BPMB+50	BPMB+50	Lead	1490		MG/KG
D	SOIL	D-SB02	OU3-D-SB02-0002	Lead	14000		MG/KG
					Avg. = 4816		

TABLE F-11.2
LEAD HOTSPOT SAMPLES
FUTURE
COMMERCIAL WORKERS
ALL SOIL (0-15 FEET BGS)
AREA D

AOC	MATRIX	BORING	SAMPLE NAME	PARAMETER	RESULT	QUAL	UNITS
D	SOIL	BPM A+09	BPM A+09	Lead	5170		MG/KG
D	SOIL	BPM A+50	BPM A+50	Lead	1670		MG/KG
D	SOIL	BPMB+50	BPMB+50	Lead	1750		MG/KG
D	SOIL	BPMB+50	BPMB+50	Lead	1490		MG/KG
D	SOIL	D-SB02	OU3-D-SB02-1214	Lead	340		MG/KG
D	SOIL	D-SB02	OU3-D-SB02-0002	Lead	14000		MG/KG
D	SOIL	D-SB02	OU3-D-SB02-0204	Lead	49000		MG/KG
D	SOIL	D-SB02	OU3-D-SB02-0204	Lead	32000		MG/KG
D	SOIL	D-SB02	OU3-D-SB02-0406	Lead	30000		MG/KG
D	SOIL	D-SB02	OU3-D-SB02-0608	Lead	20000		MG/KG
D	SOIL	D-SB02	OU3-D-SB02-0810	Lead	8200		MG/KG
D	SOIL	D-SB02	OU3-D-SB02-1416	Lead	18	J	MG/KG
D	SOIL	D-SB02	OU3-D-SB02-1416	Lead	100	U	MG/KG
D	SOIL	D-SB02	OU3-D-SB02-1012	Lead	260		MG/KG
					Avg. = 11,711		

TABLE F-11.3
LEAD HOTSPOT SAMPLES
CURRENT/FUTURE
FREQUENT RECREATIONAL USERS
SURFACE SOILS/SEDIMENTS (0-2 FEET BGS)
AREA D

AOC	MATRIX	BORING	SAMPLE NAME	PARAMETER	RESULT	QUAL	UNITS
D	WETLAND	BN03	RM-SD-BN03-02	Lead	17400		MG/KG
D	WETLAND	BR E+00	BR E+00	Lead	770		MG/KG
D	WETLAND	D-SD06	OU3-D-SD06-0002	Lead	3310		MG/KG
D	WETLAND	THTCO DE+960	THTCO DE+960 (0.00-0.25)	Lead	2400		MG/KG
					Avg.=5970		

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SURFACE SOILS - HOTSPOT - REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/maternal} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\ 0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [1]	4816	4816	4816	4816	4816
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.100	0.100	0.100	0.100	0.100
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	250	250	250	250	250
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\ central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	**17.53**	**17.53**	**18.03**	**18.03**	**17.83**
$PbB_{fetal,\ GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	**15.78**	**15.78**	**16.23**	**16.23**	**16.05**
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	**78.11%**	**73.07%**	**79.50%**	**74.30%**	**75.26%**
$PbB_{fetal,\ 0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	**41.50**	**53.48**	**42.68**	**55.00**	**50.20**
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	**768**	**480**	**616**	**328**	**472**

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SURFACE SOILS - HOTSPOT - CENTRAL TENDENCY EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/matemal} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\ 0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [(1)]	4816	4816	4816	4816	4816
BKSF	Biokinetic slope factor (ug/dL per ug/day)	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050	0.050	0.050	0.050	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	250	250	250	250	250
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/matemal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\ central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	9.62	9.62	10.12	10.12	9.92
$PbB_{fetal,\ GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	8.66	8.66	9.11	9.11	8.93
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	40.29%	42.28%	43.66%	44.97%	43.48%
$PbB_{fetal,\ 0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	22.76	29.33	23.94	30.86	27.91
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	1536	960	1232	656	945

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[(1)] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SOILS 0-15 FEET- HOTSPOT - REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/maternal} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\ 0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [1]	11,711	11,711	11,711	11,711	11,711
BKSF	Biokinetic slope factor (ug/dL per ug/day)	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.100	0.100	0.100	0.100	0.100
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	250	250	250	250	250
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\ central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	**40.20**	**40.20**	**40.70**	**40.70**	**40.50**
$PbB_{fetal,\ GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	**36.18**	**36.18**	**36.63**	**36.63**	**36.45**
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	**98.57%**	**95.85%**	**98.64%**	**95.99%**	**96.90%**
$PbB_{fetal,\ 0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	**95.15**	**122.61**	**96.33**	**124.14**	**114.00**
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	**768**	**480**	**616**	**328**	**472**

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: COMMERCIAL WORKER - SOILS 0-15 FEET- HOTSPOT - CENTRAL TENDENCY EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\ GM} = R_{fetal/maternal} \times [PbB_{adult,\ 0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\ 0.95} = PbB_{fetal,\ GM} \times GSD_{i,\ adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\ 0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\ 0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [(1)]	11,711	11,711	11,711	11,711	11,711
BKSF	Biokinetic slope factor (ug/dL per ug/day))	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050	0.050	0.050	0.050	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	250	250	250	250	250
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\ adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\ central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	**20.95**	**20.95**	**21.45**	**21.45**	**21.25**
$PbB_{fetal,\ GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	**18.86**	**18.86**	**19.31**	**19.31**	**19.13**
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	**85.97%**	**80.37%**	**86.85%**	**81.24%**	**82.52%**
$PbB_{fetal,\ 0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	**49.59**	**63.90**	**50.77**	**65.42**	**59.82**
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	**1536**	**960**	**1232**	**656**	**945**

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[(1)] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER - HOTSPOT - REASONABLE MAXIMUM EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [1]	5970	5970	5970	5970	5970
BKSF	Biokinetic slope factor (ug/dL per ug/day)	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.100	0.100	0.100	0.100	0.100
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	150	150	150	150	150
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\,central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	**13.48**	**13.48**	**13.98**	**13.98**	**13.78**
$PbB_{fetal,\,GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	**12.13**	**12.13**	**12.58**	**12.58**	**12.40**
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	**62.87%**	**60.26%**	**65.19%**	**62.14%**	**62.18%**
$PbB_{fetal,\,0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	**31.90**	**41.10**	**33.08**	**42.63**	**38.78**
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	**1280**	**800**	**1027**	**547**	**787**

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD, CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER - HOTSPOT - CENTRAL TENDENCY EXPOSURE
DATE: July 20, 2000

OBJECTIVE: Adult exposure to lead in soil is addressed by an evaluation of the relationship between the site soil lead concentration and the blood lead concentration in the developing fetuses of adult women. (U.S. EPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil, December 1996). U.S. EPA, Use of the TRW Interim Adult Lead Methodology in Risk Assessment, April 7, 1999.

RELEVANT EQUATIONS: $PbB_{fetal,\,GM} = R_{fetal/maternal} \times [PbB_{adult,\,0} + (PbS \times BKSF \times IR_s \times AF_s \times EF_s)/AT]$

and

$PbB_{fetal,\,0.95} = PbB_{fetal,\,GM} \times GSD_{i,\,adult}^{1.645}$

Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL = 1-NORMDIST ((ln(10)-ln(PbS))/ln(GSD_i))

Exposure Parameter	Description (units)	GSD_i = 1.8 - 2.1; $PbB_{adult,\,0}$ = 1.7 - 2.2				
		Adult 1	Adult 2	Adult 3	Adult 4	Adult 5
$PbB_{adult,\,0}$	Typical blood lead concentration in adult women of child-bearing age in absence of site exposures (ug/dL)	1.7	1.7	2.2	2.2	2
PbS	Site-specific soil lead concentration (mg/kg) [1]	5970	5970	5970	5970	5970
BKSF	Biokinetic slope factor (ug/dL per ug/day)	0.4	0.4	0.4	0.4	0.4
IR_s	Intake rate of soil, includes outdoor soil and indoor soil-derived dust (g/day)	0.050	0.050	0.050	0.050	0.050
AF_s	Absolute gastrointestinal absorption fraction (unitless)	0.12	0.12	0.12	0.12	0.12
EF_s	Exposure frequency (days/year)	150	150	150	150	150
AT	Averaging time (days/year)	365	365	365	365	365
$GSD_{i,\,adult}$	Estimate of individual geometric standard deviation among adults (unitless)	1.8	2.1	1.8	2.1	2
$R_{fetal/maternal}$	Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration (unitless)	0.9	0.9	0.9	0.9	0.9
$PbB_{adult,\,central}$	**Calculated central estimate of blood lead concentrations in adult women of child-bearing age from site exposures (ug/dL)**	**7.59**	**7.59**	**8.09**	**8.09**	**7.89**
$PbB_{fetal,\,GM}$	**Central estimate of blood lead concentration (ug/dL) for fetuses carried by women who have site exposures to soil lead at concentration, PbS.**	**6.83**	**6.83**	**7.28**	**7.28**	**7.10**
	Probability that $PbB_{fetal,GM}$ exceeds 10 ug/dL.	**25.82%**	**30.36%**	**29.45%**	**33.43%**	**31.06%**
$PbB_{fetal,\,0.95}$	**Calculated 95th percentile blood lead concentrations among fetuses born to women having site exposures (ug/dL)**	**17.96**	**23.14**	**19.14**	**24.67**	**22.20**
RBRG	**Lead soil concentration corresponding to a 95th percentile 10 ug/dL lead blood level in a fetus (mg/kg).**	**2560**	**1601**	**2053**	**1094**	**1574**

Note: According to the cited guidance document, this adult exposure model is not applicable for infrequent site exposures, where the EF_s is less than 1 day/week.

[1] The arithmetic mean concentration is the exposure point concentration.

IEUBK MODEL - EXPOSURE TO LEAD
SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER
DATE: APRIL 7, 2000

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

Age	Time Outdoors (hr)	Vent. Rate (m3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
0-1	1436.0	200.0
1-2	1436.0	200.0
2-3	1436.0	200.0
3-4	1436.0	200.0
4-5	1436.0	200.0
5-6	1436.0	200.0
6-7	1436.0	200.0

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

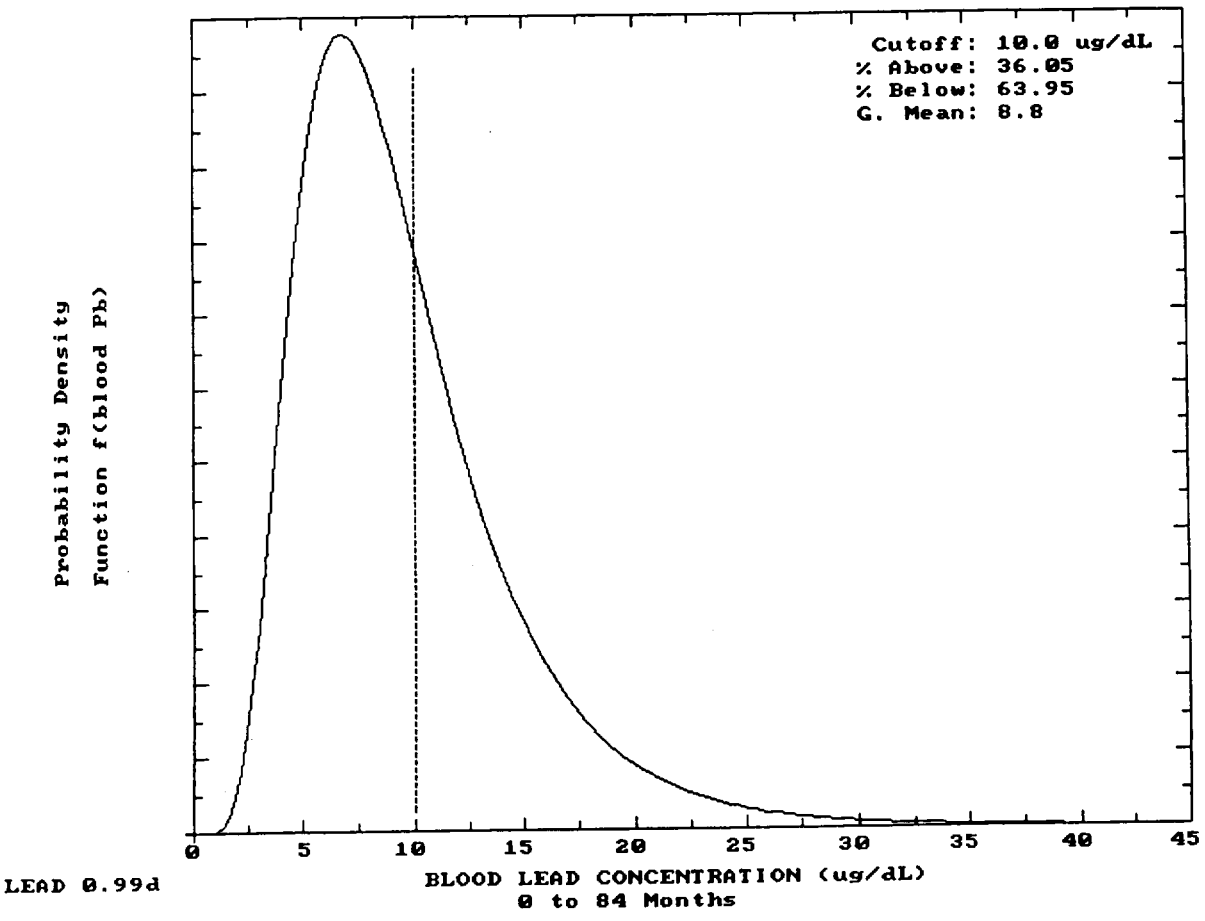
MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

YEAR	Blood Level (ug/dL)	Total Uptake (ug/day)	Soil+Dust Uptake (ug/day)
0.5-1:	9.6	18.17	15.59
1-2:	11.0	27.06	23.98
2-3:	10.3	28.20	24.68
3-4:	9.9	28.90	25.37
4-5:	8.3	23.57	19.90
5-6:	7.0	22.28	18.30
6-7:	6.3	21.82	17.48

YEAR	Diet Uptake (ug/day)	Water Uptake (ug/day)	Paint Uptake (ug/day)	Air Uptake (ug/day)
0.5-1:	2.24	0.32	0.00	0.02
1-2:	2.26	0.78	0.00	0.03
2-3:	2.62	0.84	0.00	0.06
3-4:	2.58	0.88	0.00	0.07
4-5:	2.64	0.96	0.00	0.07
5-6:	2.84	1.04	0.00	0.09
6-7:	3.17	1.07	0.00	0.09

IEUBK MODEL - EXPOSURE TO LEAD
SITE NAME: AREA D: BEACON POINT
LOCATION: FERRY CREEK, STRATFORD CONNECTICUT
RECEPTOR: FREQUENT RECREATIONAL USER
DATE: APRIL 7, 2000



Appendix F.12

PCB Congeners

Table F.12.1
PCB CONGENER AND TOXICITY EQUIVALENT CONCENTRATIONS
FERRY CREEK, STRATFORD, CT
PAGE 1 OF 1

PCB Congeners	TEF	Area D Sediment		Area D Sediment		Area E Sediment		Area E Sediment	
		CONC.(ug/kg)	TEQ	CONC.(ug/kg)	TEQ	CONC.(ug/kg)	TEQ	CONC.(ug/kg)	TEQ
Dioxin-like		OU3-D-SD03-0002		OU3-D-SD05-0002		OU3-E-SD01-0002		OU3-E-SD01-0204	
2',3,4,4',5-Pentachlorobiphenyl (123)	0.0001	37.8	0.00378	9.6	0.00096	46	0.0046	1.11	0.000111
2,3',4,4',5,5'-Hexachlorbiphenyl (167)	0.00001	24.9	0.000249	2.13	2.13E-05	2.86	0.0000286	0.082	8.2E-07
2,3'4,4',5-Pentachlorobiphenyl (118)	0.0001	18.2	0.00182	1.14	0.000114	4.84	0.000484	0.059	0.0000059
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	0.0005	72.9	0.03645	9.76	0.00488	11.5	0.00575	0.308	0.000154
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	0.0001	R	R	R	R	0.618	0.0000618	0.00835	8.35E-07
2,3,3',4,4',5-Hexachlorobiphenyl (156)	0.0005	55.8	0.0279	5.92	0.00296	4.62	0.00231	0.126	0.000063
2,3,3',4,4'-Pentachlorobiphenyl (105)	0.0001	R	R	0.0515	5.15E-06	0.0099	0.00000099	0.000605	6.05E-08
2,3,4,4',5-Pentachlorbiphenyl (114)	0.0005	R	R	87.4	0.0437	98.2	0.0491	2.34	0.00117
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	0.01	0.323	0.00323	0.185	0.00185	0.014	0.00014	0.000875	8.75E-06
3,3'4,4',5-Pentachlorobiphenyl (126)	0.1	0.775	0.0775	R	R	0.179	0.0179	0.0026	0.00026
3,3'4,4'-Tetrachlorobiphenyl (77)	0.0001	25	0.0025	3.33	0.000333	2.81	0.000281	0.0685	6.85E-06
Total Dioxin-like TEQ			**0.15**		**0.055**		**0.081**		**0.0018**
Total Dioxin-like Concentration		**235.70**		**119.52**		**171.65**		**4.11**	
Total PCB Congeners									
Decachlorobiphenyl		35.1		5.52		2		0.02775	
Total Dichlorobiphenyls		3.7		13.1		11		0.692	
Total Heptachlorobiphenyls		888		240		48.2		0.755	
Total Hexachlorobiphenyls		508		104		223		3.23	
Total Monochlorobiphenyls		3.76		0.218		0.308		0.0397	
Total Nonachlorobiphenyls		43.1		43		9.87		0.176	
Total Octachlorobiphenyls		594		143		29.8		0.525	
Total Pentachlorobiphenyls		266		191		449		9.43	
Total Tetrachlorobiphenyls		187		119		156		3.85	
Total Trichlorobiphenyls		339		87.8		47.9		2.27	
Total PCB Concentration		**2867.66**		**946.64**		**977.08**		**21.00**	

Calculation of Non Dioxin-like Concentrations

Non Dioxin-like concentrations represent the difference between the Total PCB concentrations and the concentrations of the dioxin-like congeners. The Non Dioxin-like concentrations are calculated as follows:

Total PCB Concentration	2867.66	946.64	977.08	21.00
Total Dioxin-like Concentration	235.70	119.52	171.65	4.11
Total Non Dioxin-like Concentration	**2631.96**	**827.12**	**805.43**	**16.89**

R indicates that result was rejected based on data validation. Therefore, data point was not used.

1. The maximum dioxin-like TEQ was used when the exposure point concentration had more than one sample.
2. The maximum non dioxin-like concentration was used as the exposure point concentration when an area had more than one sample.

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: CURRENT/FUTURE COMMERCIAL/INDUSTRIAL WORKER - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

WHERE:	Cs = :		Concentration in soil (mg/kg)
	IR = :	100	Soil Ingestion Rate (mg/day) ✓
	CF = :	1.0E-06	Conversion Factor (kg/mg)
	FI = :	1	Fraction from contaminated source (unitless)
	EF = :	250	Exposure Frequency (days/year)
	ED = :	25	Exposure Duration (years)
	BW = :	70	Body Weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	9,125	Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = : 3.5E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 9.8E-07 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: CURRENT/FUTURE COMMERCIAL/INDUSTRIAL WORKER - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Total TEQ - Dioxin-like Congeners	0.00015 ✓	5.2E-11	1.5E-10	1.50E+05	NA	7.9E-06	81.2%	NA	NA
Total - Nondioxin-like Congeners	2.6 ✓	9.1E-07	2.5E-06	2.00E+00	NA	1.8E-06	18.8%	NA	NA
					Total	**9.7E-06**	**100.0%**	**NA**	**NA**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: CURRENT/FUTURE COMMERCIAL/INDUSTRIAL WORKER - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:	Cs = :		Concentration in soil (mg/kg)
	CF = :	1.0E-06	Conversion factor (kg/mg)
	SA = :	2,500	Skin surface available for contact (cm^2/event) ✓
	AF = :	0.20	Soil to skin adherence factor (mg/cm^2) ✓
	ABS = :		Absorption factor (unitless)
	EF = :	250	Exposure frequency (events/year)
	ED = :	25	Exposure duration (years)
	BW = :	70	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	9,125	Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = : 1.7E-06 kg-soil/kg-wt/day
Chronic Daily Intake = : 4.9E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: CURRENT/FUTURE COMMERCIAL/INDUSTRIAL WORKER - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Total TEQ - Dioxin-like Congeners	0.00015	0.001	2.62E-13	7.34E-13	1.50E+05	NA	3.9E-08	3.0%	NA	NA
Total - Nondioxin-like Congeners	2.6	0.14	6.36E-07	1.78E-06	2.00E+00	NA	1.3E-06	97.0%	NA	NA
						Total	**1.3E-06**	**100.0%**	**NA**	**NA**

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: CURRENT/FUTURE COMMERCIAL/INDUSTRIAL WORKER - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
Total TEQ - Dioxin-like Congeners	7.9E-06	3.9E-08	NA	7.9E-06	71.9%	NA	NA	NA	NA	NA
Total - Nondioxin-like Congeners	1.8E-06	1.3E-06	NA	3.1E-06	28.1%	NA	NA	NA	NA	NA
Total	**9.7E-06** ✓	**1.3E-06** ✓	**NA**	**1.1E-05**	**100.0%**	**NA**	**NA**	**NA**	**NA**	**NA**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$\text{Intake} = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

WHERE:	Cs = :		Concentration in soil (mg/kg)
	IR = :	100	Soil Ingestion Rate (mg/day)
	CF = :	1.0E-06	Conversion Factor (kg/mg)
	FI = :	1	Fraction from contaminated source (unitless)
	EF = :	20	Exposure Frequency (days/year) ✓
	ED = :	24	Exposure Duration (years)
	BW = :	70	Body Weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	8,760	Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = : 2.7E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 7.8E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Total TEQ - Dioxin-like Congeners	0.00015	4.0E-12	1.2E-11	1.50E+05	NA	6.0E-07	81.2%	NA	NA
Total - Nondioxin-like Congeners	2.6	7.0E-08	2.0E-07	2.00E+00	NA	1.4E-07	18.8%	NA	NA
					Total	**7.4E-07**	**100.0%**	**NA**	**NA**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:

$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:	Cs = :		Concentration in soil (mg/kg)
	CF = :	1.0E-06	Conversion factor (kg/mg)
	SA = :	5,700	Skin surface available for contact (cm^2/event) ✓
	AF = :	0.3	Soil to skin adherence factor (mg/cm^2) ✓
	ABS = :		Absorption factor (unitless)
	EF = :	20	Exposure frequency (events/year) ✓
	ED = :	24	Exposure duration (years)
	BW = :	70	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	8,760	Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 1.3E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Total TEQ - Dioxin-like Congeners	0.00015	0.001	6.88E-14	2.01E-13	1.50E+05	NA	1.0E-08	3.0%	NA	NA
Total - Nondioxin-like Congeners	2.6	0.14	1.67E-07	4.87E-07	2.00E+00	NA	3.3E-07	97.0%	NA	NA
						Total	**3.4E-07**	**100.0%**	**NA**	**NA**

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA D, BEACON POINT (NORTH AND SOUTH)
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
Total TEQ - Dioxin-like Congeners	6.0E-07	1.0E-08	NA	6.1E-07	56.5%	NA	NA	NA	NA	NA
Total - Nondioxin-like Congeners	1.4E-07	3.3E-07	NA	4.7E-07	43.5%	NA	NA	NA	NA	NA
Total	**7.4E-07** ✓	**3.4E-07** ✓	**NA**	**1.1E-06**	**100.0%**	**NA**	**NA**	**NA**	**NA**	**NA**

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH INCIDENTAL INGESTION OF SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION: $$Intake = \frac{Cs \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

WHERE:	Cs = :		Concentration in soil (mg/kg)
	IR = :	100	Soil Ingestion Rate (mg/day)
	CF = :	1.0E-06	Conversion Factor (kg/mg)
	FI = :	1	Fraction from contaminated source (unitless)
	EF = :	20	Exposure Frequency (days/year)
	ED = :	24	Exposure Duration (years)
	BW = :	70	Body Weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	8,760	Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = : 2.7E-08 kg-soil/kg-wt/day
Chronic Daily Intake = : 7.8E-08 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

CHEMICAL	Cs (mg/kg)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Total TEQ - Dioxin-like Congeners	0.000081 ✓	2.2E-12	6.3E-12	1.50E+05	NA	3.3E-07	88.2%	NA	NA
Total - Nondioxin-like Congeners	0.81 ✓	2.2E-08	6.3E-08	2.00E+00	NA	4.3E-08	11.8%	NA	NA
					Total	**3.7E-07**	**100.0%**	**NA**	**NA**

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME ✓
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH DERMAL CONTACT WITH SOIL ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

RELEVANT EQUATION:

$$\text{Absorbed Dose} = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:	Cs = :		Concentration in soil (mg/kg)
	CF = :	1.0E-06	Conversion factor (kg/mg)
	SA = :	✓5,700	Skin surface available for contact (cm^2/event)
	AF = :	✓0.3	Soil to skin adherence factor (mg/cm^2)
	ABS = :		Absorption factor (unitless)
	EF = :	✓20	Exposure frequency (events/year)
	ED = :	✓24	Exposure duration (years)
	BW = :	70	Body weight (kg)
	ATc = :	25,550	Averaging time for carcinogenic exposures (days)
	ATn = :	3,285	Averaging time for noncarcinogenic exposures (days)

Unit Dose
Lifetime Chronic Daily Intake = : 4.6E-07 kg-soil/kg-wt/day
Chronic Daily Intake = : 3.6E-06 kg-soil/kg-wt/day

RISK ASSESSMENT SPREADSHEET - DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

CHEMICAL	Cs (mg/kg)	ABS (unitless)	Lifetime Chronic Daily Intake (mg/kg/day)	Chronic Daily Intake (mg/kg/day)	Cancer Slope Factor $(mg/kg/day)^{-1}$	Reference Dose (mg/kg/day)	Lifetime Cancer Risk	Percent Cancer Risk	Hazard Quotient	Percent Hazard Quotient
Total TEQ - Dioxin-like Congeners	0.000081	0.03	1.12E-12	8.67E-12	1.50E+05	NA	1.7E-07	61.6%	NA	NA
Total - Nondioxin-like Congeners	0.81	0.14	5.20E-08	4.05E-07	2.00E+00	NA	1.0E-07	38.4%	NA	NA
						Total	**2.7E-07**	**100.0%**	**NA**	**NA**

RISK ASSESSMENT SPREADSHEET - SUMMARY

SITE NAME: AREA E, ELM STREET
LOCATION: FERRY CREEK, STRATFORD, CT
EXPOSURE SCENARIO: WETLAND/MARSH RECEPTOR - ADULT - RME
MEDIA: ALL SOIL (PCB CONGENER DATA ONLY)
DATE: FEBRUARY 10, 2000

	Lifetime Cancer Risk					Hazard Index				
Chemical	Incidental Ingestion	Dermal Contact	Inhalation	Total Risk	Percent Risk	Incidental Ingestion	Dermal Contact	Inhalation	Total HI	Percent HI
Total TEQ - Dioxin-like Congeners	3.3E-07	1.7E-07	NA	4.9E-07	77.0%	NA	NA	NA	NA	NA
Total - Nondioxin-like Congeners	4.3E-08	1.0E-07	NA	1.5E-07	23.0%	NA	NA	NA	NA	NA
Total	**3.7E-07**	**2.7E-07**	**NA**	**6.4E-07**	**100.0%**	**NA**	**NA**	**NA**	**NA**	**NA**